

(No Model.)

2 Sheets—Sheet 1.

H. N. H. LUGRIN.  
APPARATUS FOR LIGHTING THE INTERIORS OF BUILDINGS.  
No. 494,299.  
Patented Mar. 28, 1893.

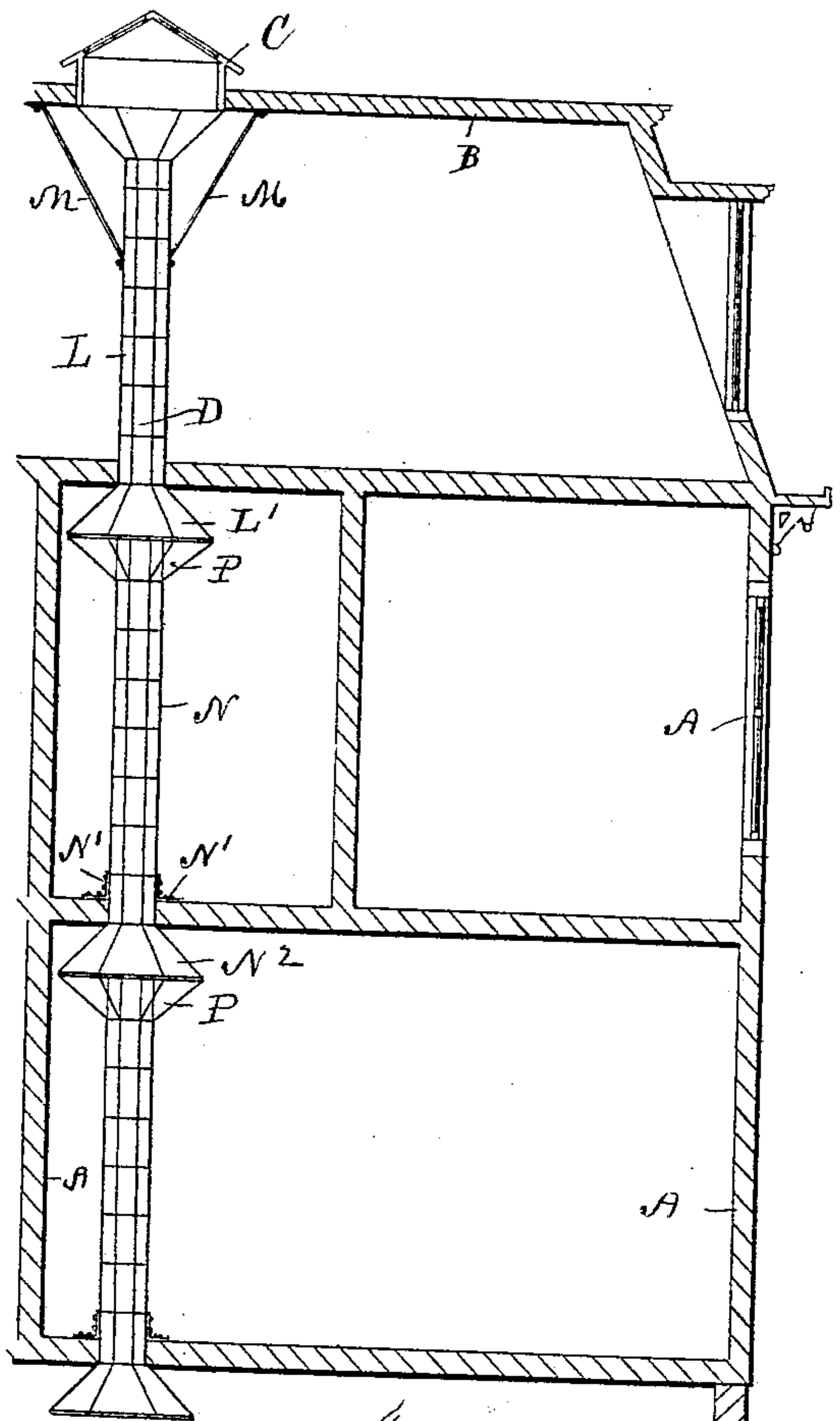


Fig. 1.

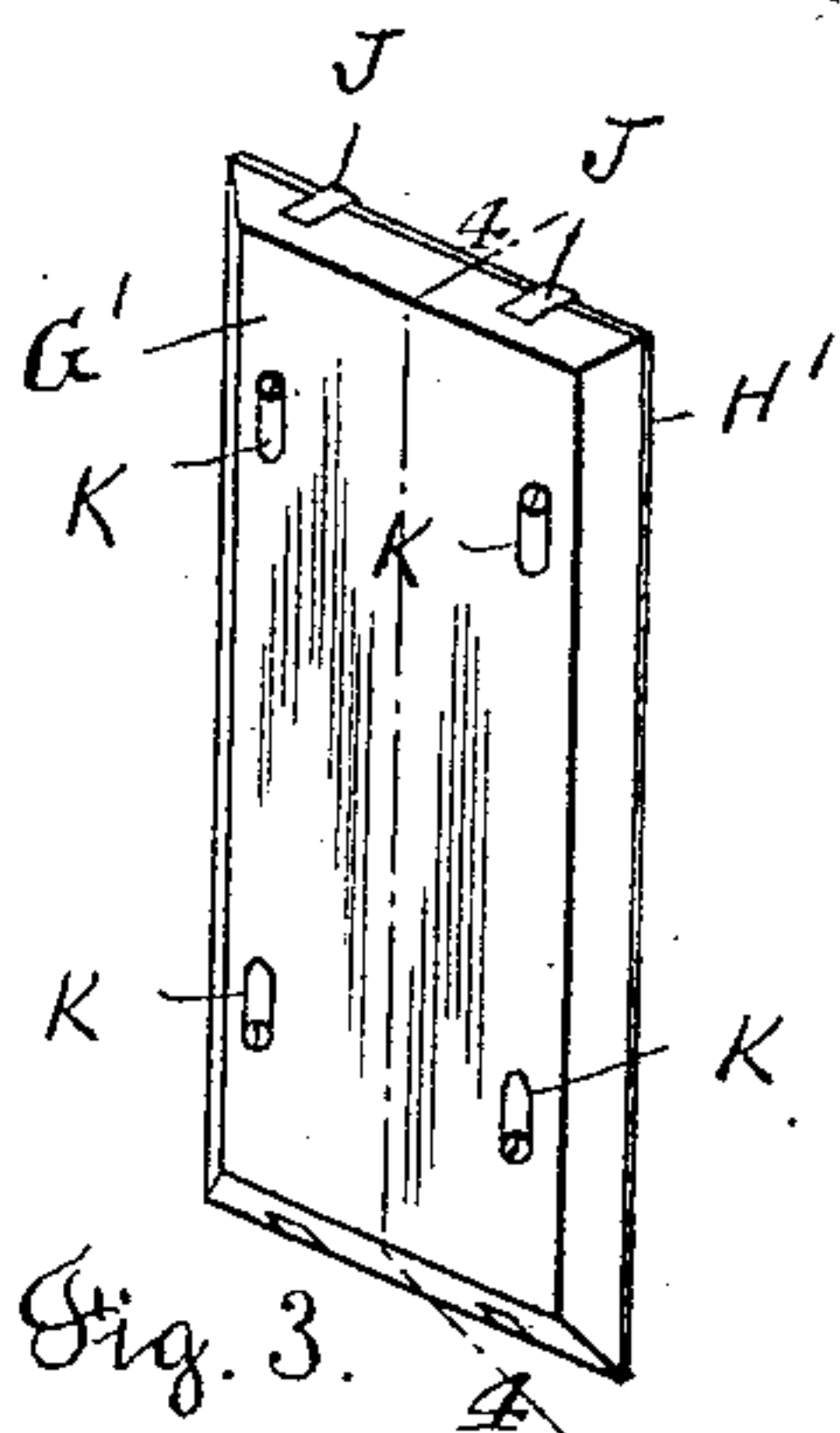


Fig. 3.

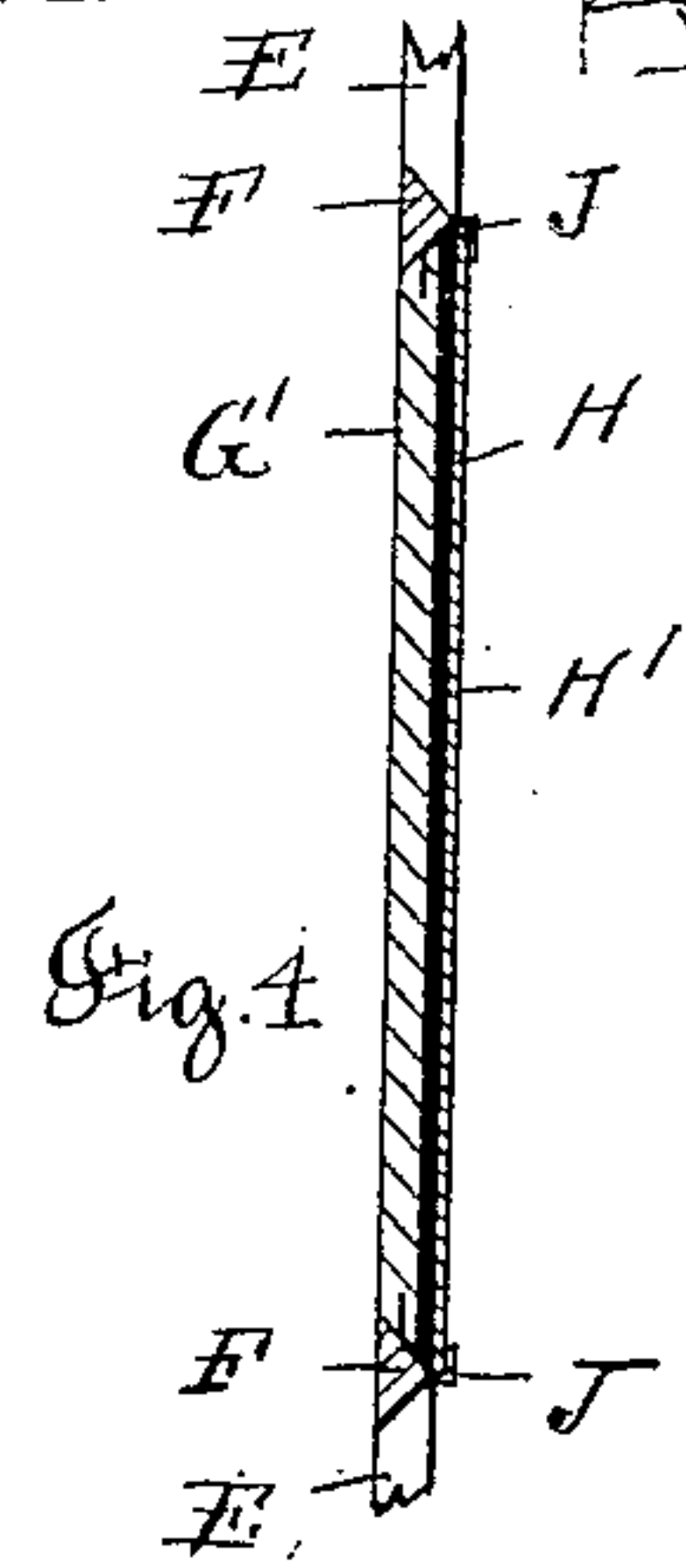


Fig. 4.

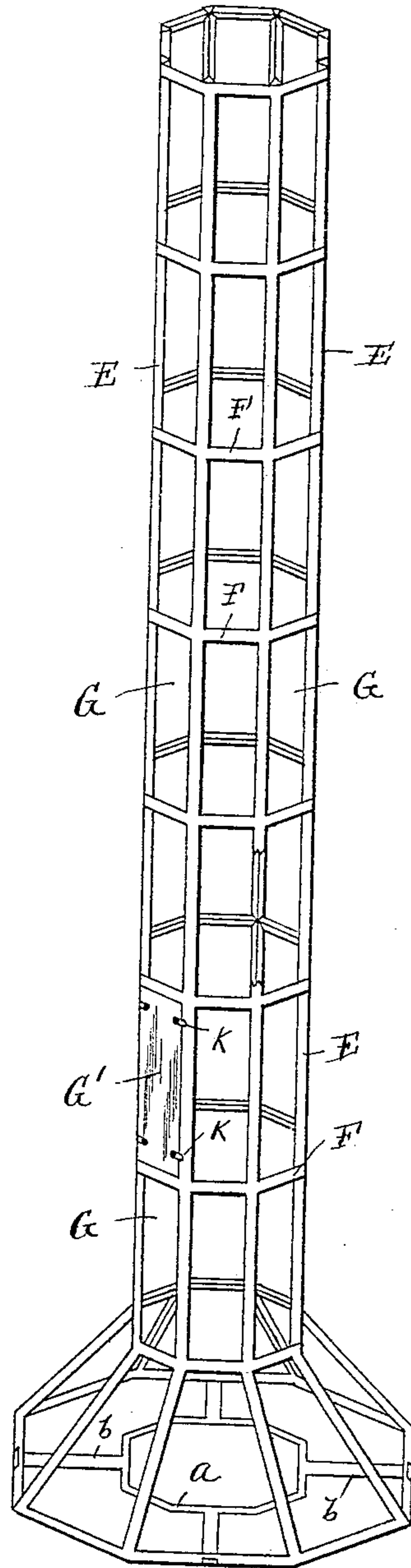


Fig. 2.

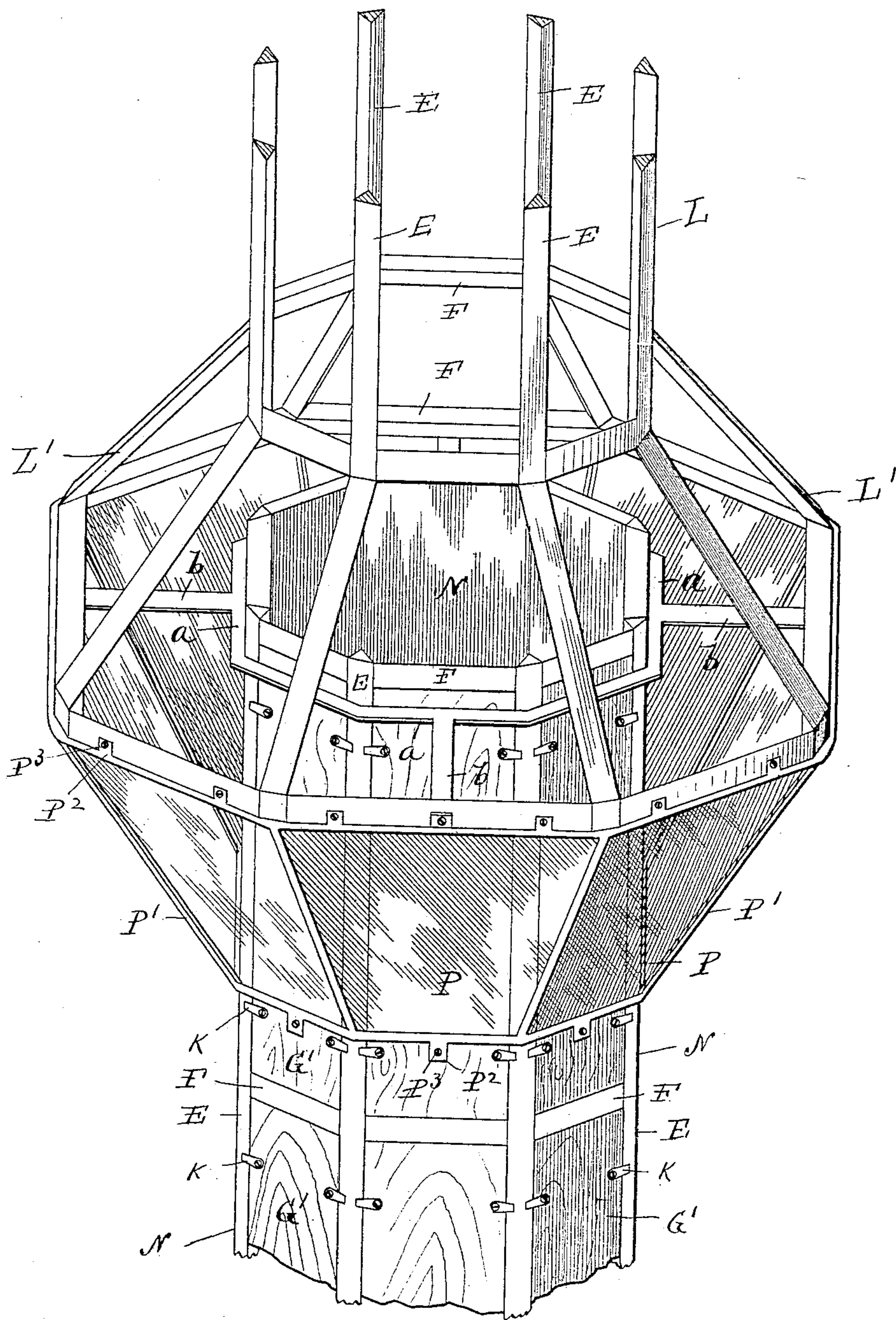
Witnesses  
Allie C. Whiting  
Emma Hester

Inventor  
Horatio N. H. Lugin.  
By his Attorney  
Rufus B. Fowler

(No Model.)

2 Sheets—Sheet 2.

H. N. H. LUGRIN.  
APPARATUS FOR LIGHTING THE INTERIORS OF BUILDINGS.  
No. 494,299.  
Patented Mar. 28, 1893.



Witnesses  
Allie C. Whiting.  
Emma Kester.

Fig. 5.

Inventor

Horatio N. H. Lugin.

By his Attorney

Reuben L. Fowler



# UNITED STATES PATENT OFFICE.

HORATIO N. H. LUGRIN, OF WORCESTER, MASSACHUSETTS.

## APPARATUS FOR LIGHTING THE INTERIOR OF BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 494,299, dated March 28, 1893.

Application filed September 28, 1892. Serial No. 447,169. (No model.)

*To all whom it may concern:*

Be it known that I, HORATIO N. H. LUGRIN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in an Apparatus for Lighting the Interior of Buildings, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, and in which—

Figure 1 represents a building in vertical, sectional view and containing my improved apparatus for conveying light from the outside of the building to the interior apartments; the apparatus being shown in elevation. Fig. 2 is a perspective view of the frame-work, forming one section of the light conveying shaft and by which the reflecting mirrors are supported, one of the mirrors being shown in position. Fig. 3 is a detached view of one of the mirrors. Fig. 4 is a sectional view of one of the mirrors on line 4, 4, Fig. 3, and Fig. 5 is a perspective view of the frame-work forming the flaring mouth, or lower end of one of the sections with the upper and inclosed end of the next lower section.

Similar letters refer to similar parts in the different figures.

The object of my invention is to provide a simple and efficient apparatus, which can easily be constructed for the purpose of conveying light from the outside of a building to the interior rooms and this object is attained by means of the apparatus hereinafter described and represented in the accompanying drawings in which

A, A, denote the outer walls of the building and B the roof provided with a sky-light C, through which light is admitted, and which serves to protect the upper end of a hollow light shaft D, extending downward and conveying light to the interior rooms of the building. The tubular light shaft D can extend from the sky-light C to any desired distance in a continuous tube; but it is preferably constructed in sections corresponding with the floors of the building, in order to allow each section to be independently supported and the sections to be capable of a slight sliding, or telescopic, movement within each other, to allow for the settling of the foundations of the building, or for the shrinkage of the wood

work forming the frame of the building. The construction of the light shaft in separate sections provides a convenient means, by which a portion of the light can be diverted from the shaft into the apartments upon different floors. The light shaft represented in the accompanying drawings is octagonal in its cross section, but it can be made quadrilateral, or with any desired number of sides.

The shaft D consists of a frame-work of triangular bars E and F and provided with a series of rectangular openings G, within which are inserted panels G' provided with a reflecting surface upon their inner side. The bars E and F of which the frame-work of the shaft is composed, are preferably triangular in shape and the edges of the panels G' are beveled to correspond with the beveled sides of the frame-work in order to allow the inner sides of the panels to form a continuous mirror, or reflecting surface. The panels are made of wood, or any suitable material and have beveled edges to fit the beveled sides of the bars forming the frame-work. The inner side of the panel is covered with some adhesive material H, which will readily adhere to the surface of the panel and to the side of a glass plate H', which is attached to the panel by the intervening adhesive material and also held in place during the setting, or hardening of the adhesive material by the metallic staples J having one end inserted in, or attached to the edge of the panels and the other end bent over the edge of the glass plate. The glass plates can have their backs covered with a reflecting material forming an ordinary mirror, or the adhesive material itself can consist of a dark substance, such as asphalt, which will form a reflecting surface upon the back of the glass.

The panels G' are inserted through the rectangular openings G and are brought into place and fastened by buttons K attached to the panels and extending over the edge of the frame-work, or they may be provided with a sliding bolt, or rod, upon one end of the panel and a spur, or prong, projecting from the opposite end and entering sockets in the frame-work. The upper section L of the shaft is preferably supported by suspension rods M, or by angle-irons from the roof B. The lower end of the upper section L terminates below the



ceiling of the upper story and is provided with a flaring bell mouth  $L'$ , within which is inserted the upper end of the second section  $N$ , which can be suspended from the ceiling in the same manner as the upper section  $L$ , or supported by angle-irons  $N'$  attached to the floor, the upper end of the section being held in alignment by a metallic rim  $a$  inclosing the upper end of the section and attached by arms  $b$  to the lower end of the upper section  $L$ , the rim  $a$  being large enough to allow a slight sliding movement of its inclosed section. The second section  $N$  terminates below the ceiling of the next lower story and is provided with an expanded end, or mouth  $N^2$  receiving the upper end of the next succeeding section  $O$  which is supported upon the next lower floor in the same manner as already described.

The open spaces around the upper and inclosed ends of the sections are closed by panes of glass  $P$ , either supported at their upper and lower edges or by the frame-work  $P'$  attached to the frame-work of the shafts by ears  $P^2$  and screws  $P^3$ . The panes of glass  $P$  allow a portion of the light to be transmitted from the interior of the shaft to the apartments through which it passes and at the same time they close the shaft against any upward current of air, or the panes of glass can be exchanged for mirrors, causing the entire light to be carried downward to the apartments below. It is obvious that such modification can be made in the form of the flaring end of the sections, as will cause the light diverted from the light shaft at each apartment to be thrown in one direction instead of being diffused in an annular space around the light shaft allowing the shaft to be carried through the apartment at the side, and the light to be equally and uniformly diffused throughout the apartment. Any of the panels  $G'$  can be removed allowing access to the interior of the shaft and in some cases serving as a ventilating opening for the apartment through which the shaft passes, by the removal of one of the panels an opening can readily be made in the shaft for the purpose of introducing a branch tube through which light can be conducted to adjoining rooms.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The within described tubular light conducting shaft comprising a frame-work of vertical and horizontal bars, preferably tri-

angular in their cross section, in order to present an edge upon the interior surface of the shaft, said bars inclosing a series of openings and panels having beveled edges fitting said openings with reflecting surfaces, substantially as described.

2. In a tubular light conducting shaft, the frame-work composed of the vertical bars  $E$  and horizontal bars  $F$ , triangular in their cross section, so as to present an edge upon the interior of the shaft, said bars inclosing a series of openings  $G$ , panels  $G'$  fitting said openings, said panels having a reflecting surface upon their inner sides and means for detachably fastening said panels within said openings, substantially as described.

3. In a tubular light conducting shaft, the combination with a supporting frame-work provided with a series of openings, of panels  $G'$  fitting said openings and provided with a coating of adhesive material upon their inner sides and glass plates  $I$  resting upon said adhesive material and forming a reflecting surface, substantially as described.

4. In a tubular light conducting shaft formed in sections, one of said sections having at its inner, or light discharging end a flaring mouth and another of said sections having its light receiving end inclosed by said flaring mouth, with the opposing end of the two sections held in alignment, but separated, whereby a portion of the light is diverted from said shaft, substantially as described.

5. The combination in a tubular light conducting shaft formed in sections, of a flaring mouth  $L'$  attached to one of said sections and inclosing an end of another section, forming an annular space, through which a portion of the light is diverted from said shaft, said annular space being closed by a frame-work  $P'$  and glass panels  $P$  held in said frame-work, substantially as described.

6. A tubular light conducting shaft made in sections, each of said sections having an independent support within the building and said sections being telescopically connected, substantially as described.

Dated this 20th day of September, 1892.

HORATIO N. H. LUGRIN.

Witnesses:

RUFUS B. FOWLER,  
EMMA KESTER.